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TITLE: Teleconnection, regime shift, and predictability of climate extremes:
A case study for the Russian heat wave and Pakistan flood in summer 2010.

PRESENTATION TYPE:

CURRENT SECTION/FOCUS GROUP: Nonlinear Geophysics (NG)

CURRENT SESSION:

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ABSTRACT BODY: In this talk, we present observational evidence showing that the two major extremes events of the summer of 2010, i.e., the Russian heat wave and the Pakistan flood were physically connected. We find that the Pakistan flood was contributed by a series of unusually heavy rain events over the upper Indus River Basin in July-August. The rainfall regimes shifted from an episodic heavy rain regime in mid-to-late July to a steady heavy rain regime in August. An atmospheric Rossby wave associated with the development of the Russian heat wave was instrumental in spurring the episodic rain events , drawing moisture from the Bay of Bengal and the northern Arabian Sea. The steady rain regime was maintained primarily by monsoon moisture surges from the deep tropics. From experiments with the GEOS-5 forecast system, we assess the predictability of the heavy rain events associated with the Pakistan flood. Preliminary results indicate that there are significantly higher skills in the rainfall forecasts during the episodic heavy rain events in July, compared to the steady rain period in early to mid-August. The change in rainfall predictability may be related to scale interactions between the extratropics and the tropics,

resulting in a modulation of rainfall predictability by the circulation regimes.

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